Amended Patent Claims

1. (original) A gas sensor on a membrane layer (3) formed on a semiconductor substrate (2) on which a metallic evaluating or electrode structure (7) is arranged in an evaluating region (8) to a metallic heating structure (9) is arranged outside the evaluating region (8) and a gas sensor layer (10) disposed on the evaluating or electrode structure (7) and the heating structure (9), whereby the gas sensitive layer (10) is heatable by the heating structure (9) and the electrical resistance of the gas sensitive layer (10) is evaluatable by the evaluating and electrode structure (7) and whereby the heating structure (9) is disposed on an adhesion promoting oxide layer (6) on the upper side of the membrane layer (3) and is separated by a cover oxide layer (11) from the gas sensitive layer (10) characterized in that in the evaluating region (8) an adhesion promoting layer (13) which is not sensitive to an oxide etching is located between the membrane layer (3) and the evaluating or electrode structure (7).

2. (original) The gas sensor according to claim 1 characterized in that the adhesion promoting layer (13) is structured correspondingly to the evaluating or electrode structure (7).

3. (original) A gas sensor on a membrane layer (3) formed on a semiconductor substrate (2) on which a metallic evaluating or electrode structure (7) is arranged in an evaluating region (8) to a metallic heating structure (9) is arranged outside the evaluating region (8) and a gas sensor layer (10) disposed on the evaluating or electrode structure (7) and the heating structure (9), whereby the gas sensitive layer (10) is heatable by the heating structure (9) and the electrical resistance of the gas sensitive layer (10) is evaluatable by the evaluating and electrode structure (7) and whereby the heating structure (9) is disposed on an adhesion promoting oxide layer (6) on the upper side of the membrane layer (3) and is separated by a cover oxide layer (11) from the gas sensitive layer (10) characterized in that the evaluating or electrode structure (7) in the evaluating region (8) corresponding to the heating structure (9) is separated from the gas sensitive layer (10) by the cover oxide layer (11), whereby the cover oxide layer (11) has contact holes (12) which each respectively exposes an intermediate region of the surface of the evaluating or electrode structure (7) to enable a direct contact between the evaluating or electrode structure (7) and the gas sensitive layer (10) to be made.

4. (original) The gas sensor according to claim 3 characterized in that the cover oxide layer (11) in the evaluating region (8) of the evaluating or electrode structure (7) is comprised of a stoichiometric oxide.

5. (currently amended) The gas sensor according to ~~one of the preceding claims~~ claim 1 characterized in that the cover oxide layer (11a) at least in the region of the heating structure (9) is comprised of a substoichiometric oxide in order to produce a relatively good bond of the cover oxide layer (11) to the heating structure (9).

6. (currently amended) The gas sensor according to ~~one of the preceding claims~~ claim 1 characterized in that the membrane layer (3) is comprised of a nitride layer (5) which preferably has an oxide layer (4) bounding on the semiconductor substrate (2).

7. (currently amended) The gas sensor according to ~~one of the preceding claims~~ claim 1 characterized in that a temperature measurement resistance is provided on the adhesion promoting oxide layer (6) in the region of the heating structure (9).

8. (currently amended) The gas sensor according to ~~one of the preceding claims~~ claim 1 characterized in that the evaluating or electrode structure (7) the heating structure (9) and the temperature measurement resistance are comprised of the same metallic material, preferably platinum.

9. (currently amended) The gas sensor according to ~~one of the preceding claims~~ claim 1, characterized in that the evaluating or electrode structure (7) is configured as an interdigital structure with two coplanar finger-like electrodes interdigitating with one another.

10. (original) A method of producing a gas sensor characterized by the following method steps:

(a) preparing a semiconductor substrate (2);

(b) providing a membrane layer (3) on a front side of the semiconductor substrate (2);

(c) depositing an adhesion promoting oxide layer (6) on the upper side of the membrane layer (3);

(d) structuring the adhesion promoting oxide layer (6) in order to prepare an oxide free evaluating region (8) on the membrane layer (3);

(e) applying an adhesion promoting layer (13) which is not sensitive to an oxide etching on the front side of the semiconductor substrate (2);

(f) removing the adhesion promoting layer (13) outside the evaluating region (8);

(g) applying a metallization layer on the front side of the semiconductor substrate (2);

(h) structuring a heating structure outside the evaluating region 8 on the adhesion promoting oxide layer (6) and an evaluating or electrode structure (7) in the evaluating region (8) on the adhesion promoting layer (13);

(i) applying a cover oxide layer (11) to the front sides of the semiconductor (2);

(j) carrying out a wide area oxide etching of the cover oxide layer (11) in the evaluating region (8) to expose the surface of the evaluating or electrode structure (7);

(k) etching the back side of the semiconductor substrate (2) until the membrane layer (3) is reached; and

(l) applying a gas sensitive layer (10) to the front side of the semiconductor substrate (2).

11. (original) The method according to claim 10 characterized in that the adhesion promoting layer (13) is additionally structured corresponding to the structuring of the evaluating or electrode structure.

12. (original) A method of producing a gas sensor characterized by the following method steps:

(a) preparing a semiconductor substrate (2);

(b) providing a membrane layer (3) on a front side of the semiconductor substrate (2);

(c) depositing an adhesion promoting oxide layer (6) on the upper side of the membrane layer (3);

(d) applying a metallization layer to the adhesion promoting oxide layer (6);

(e) structuring a heating structure (9) and an evaluating or electrode structure (7) in the metallization layer;

(f) applying a cover oxide layer to the front side of the semiconductor substrate (2);

(g) carrying out an oxide etching of contact holes (12) in the cover oxide layer (11) to expose respective central region of the surface of the evaluating or electrode structure (7);

(h) etching the back side of the semiconductor substrate (2) until the membrane layer (3) is reached; and

(I) applying a gas sensitive layer (10) to the front side of the semiconductor substrate;

13. (original) The method according to claim 12 characterized in that the cover oxide layer (11) at least in the evaluating region (8) is comprised of a substoichiometric oxide layer (11b).

14. (currently amended) The method according to ~~one of claims 10 to 13~~ claim 10 characterized in that the cover oxide layer (11) is comprised at least in the region of the heating structure (9) of a substoichiometric oxide layer 11a to produce a relatively good bond of the cover oxide layer 11 to the heating structure (9).

15. (currently amended) The method according to ~~one of claims 10 through 14~~ claim 10 characterized in that the membrane layer (3) is formed from a nitride layer (5) which preferably is applied to an oxide layer 4 bounding on the semiconductor substrate (2).

16. (currently amended) The method according to ~~one of claims 10 through 15~~ claim 10 characterized in that a temperature measuring resistance is structured on the adhesion promoting oxide layer (6) in the region of the heating structure (9).

17. (currently amended) The method according to ~~one of claims 10 through 16~~ claim 10 characterized in that the gas sensitive layer (10) is applied in a paste form and is then sintered.

18. (currently amended) The method according to ~~one of claims 10 through 16~~ claim 10 characterized in that the gas

sensitive layer is applied by sputtering or a CVD process and optionally is sintered.

Atty's 23484 Pat. App. Not known - US phase of PCT/DE2004/001645

This preliminary amendment is submitted to provide the cross reference of the present US phase of PCT/DE2004/001645 to the international application according to Rule 78 and to eliminate multiple dependencies in the claims.

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